Engineering With Nature

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BG Hill & SWD Commanders Visit
16 January 2015

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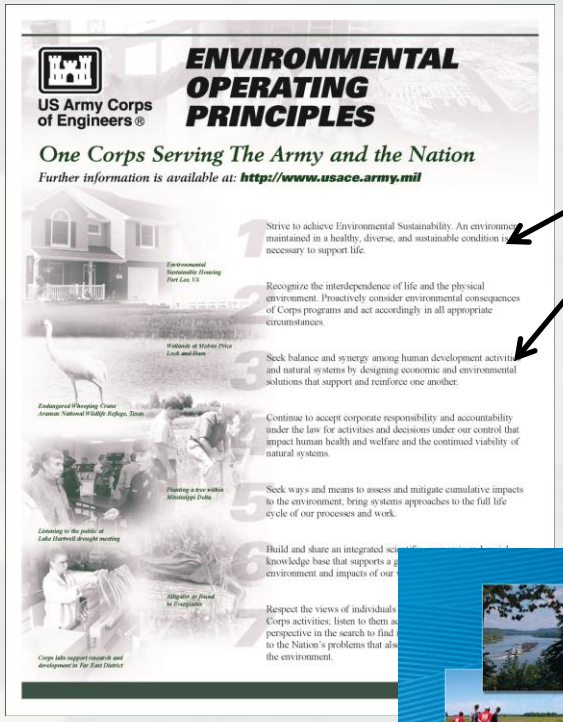
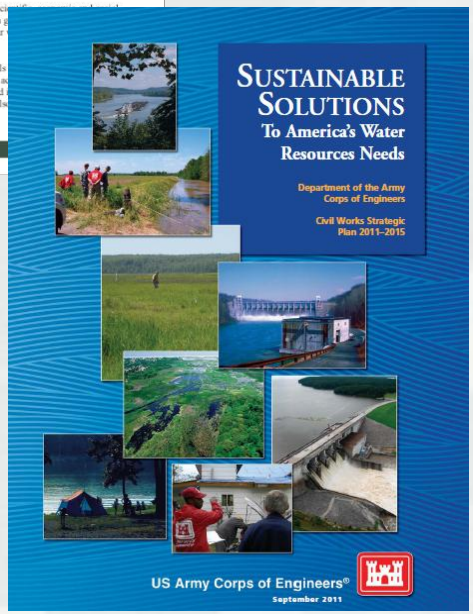
US Army Corps of Engineers
BUILDING STRONG®

Evolving USACE Practice





Sustainable Solutions Vision: "Contribute to the strength of the Nation through innovative and environmentally sustainable solutions to the Nation's water resources challenges."

Goals:

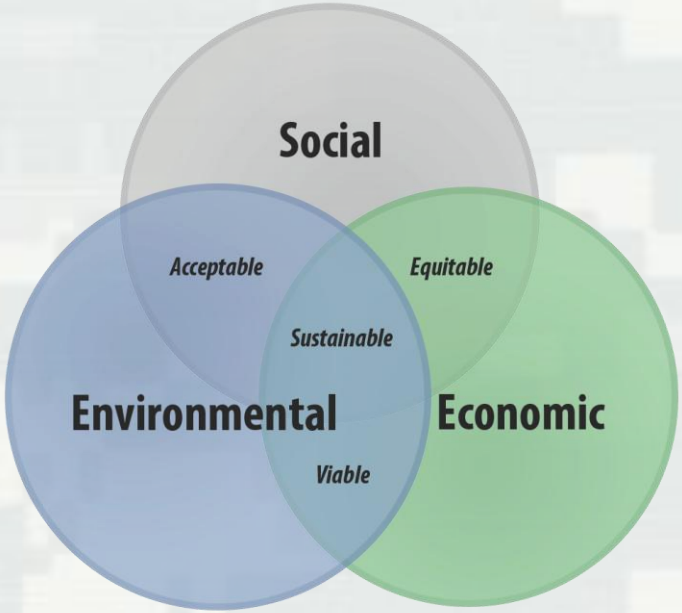
- More efficient, cost effective engineering and operational practices.
- More collaboration and cooperation, less unproductive conflict.
  - Ports, commercial interests, regulators, NGOs, and others
- Sustainable projects. Triple-win outcomes integrating social, environmental and economic objectives.

Engineering With Nature…

…the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaborative processes.

Key Elements:

- Science and engineering that produces operational efficiencies
- Using natural process to maximum benefit
- Broaden and extend the benefits provided by projects
- Science-based collaborative processes to organize and focus interests, stakeholders, and partners



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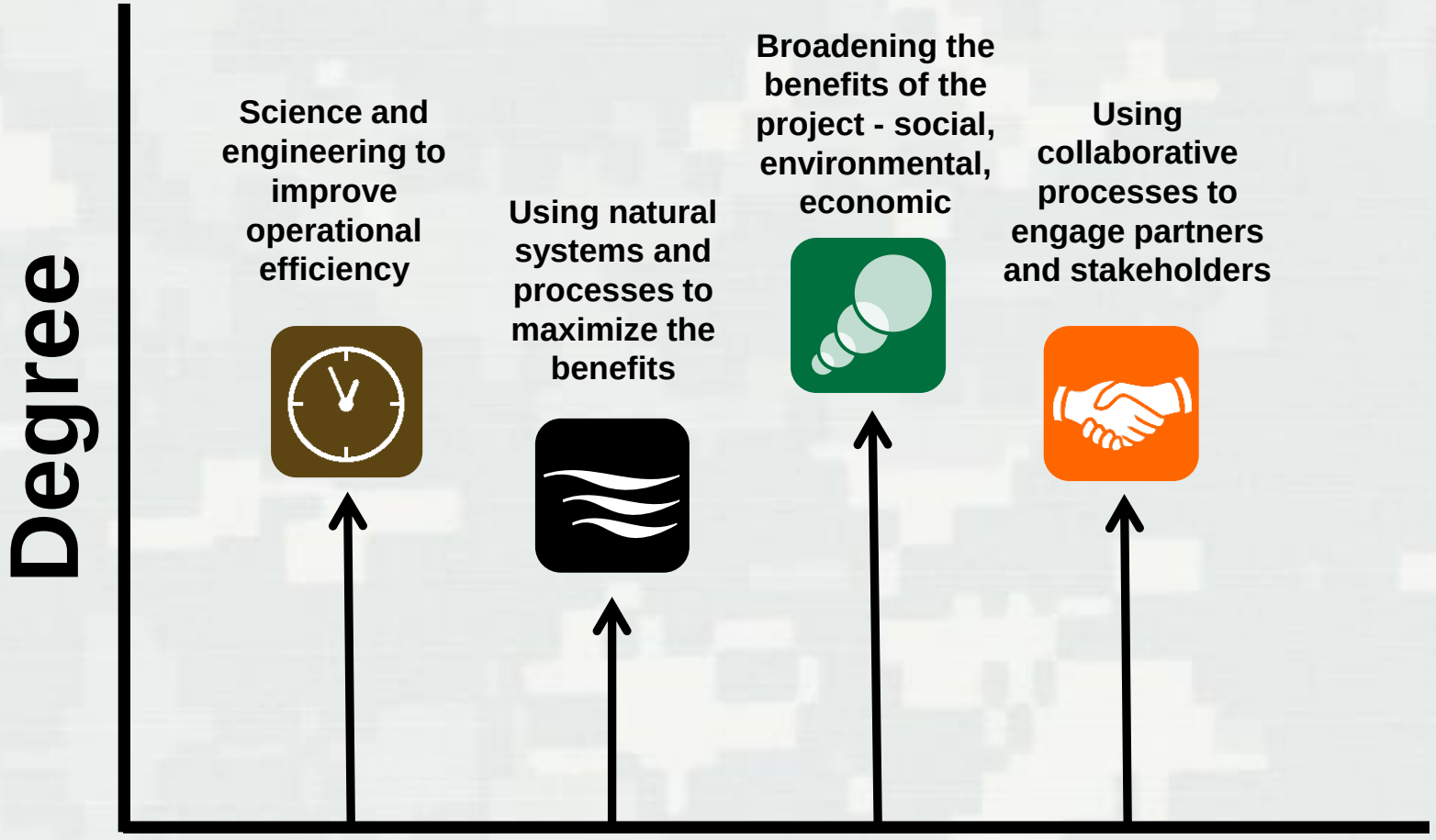
EWN Elements

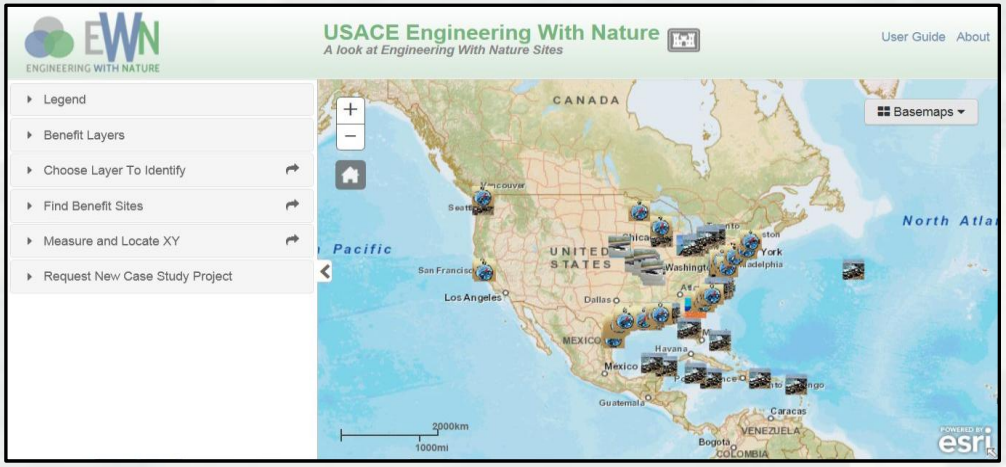


EWN Status

- *Engineering With Nature* initiative started within USACE Civil Works program in 2010. Over that period, we have:
  - Engaged across USACE Districts (23), Divisions, HQ; other agencies, NGOs, academia, private sector, international collaborators
    - Workshops (>20), dialogue sessions, project development teams, etc.
  - Implementing strategic plan
  - Focused research projects on EWN
  - Field demonstration projects
  - Communication plan
  - Awards
    - 2013 Chief of Engineers Environmental Award (Natural Resources Conservation)
    - 2014 USACE National Award (Green Innovation)

EWN Project Mapping Tool (EWN ProMap)

- Online GIS database of projects illustrating EWN principles and practices
  - Illustrating the key elements of EWN
- Currently contains ~175 projects
  - Name
  - Manager/Owner
  - Description
  - Infrastructure association e.g., jetty, breakwater, channel
  - Benefits e.g., fish habitat, bird habitat, recreation
  - Links, reports, photos
- Designed to facilitate communication about opportunities, lessons learned, and good practices
- Projects examples can be added through a process of self-nomination and independent evaluation



http://gis2.sam.usace.army.mil/applications/opj/v013/

Example EWN Solutions

Houston Navigation Channel – marsh restoration at Atkinson Island


Texas City Channel –1,000 acres of marsh in Lower Galveston Bay


Sabine-Neches Waterway– Bessie Heights Marsh

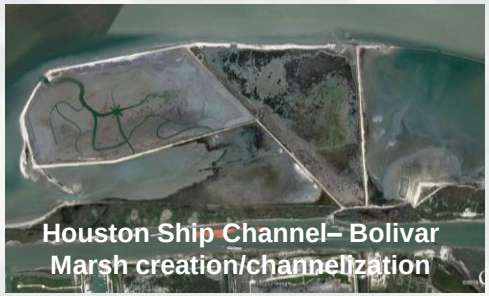

GIWW– Aransas National Wildlife Refuge – 1,600 acres of marsh


Brazos Island Harbor – 3,000 feet of beach nourishment at South Padre Island


Port Mansfield Channel – 3 acres beach nourishment

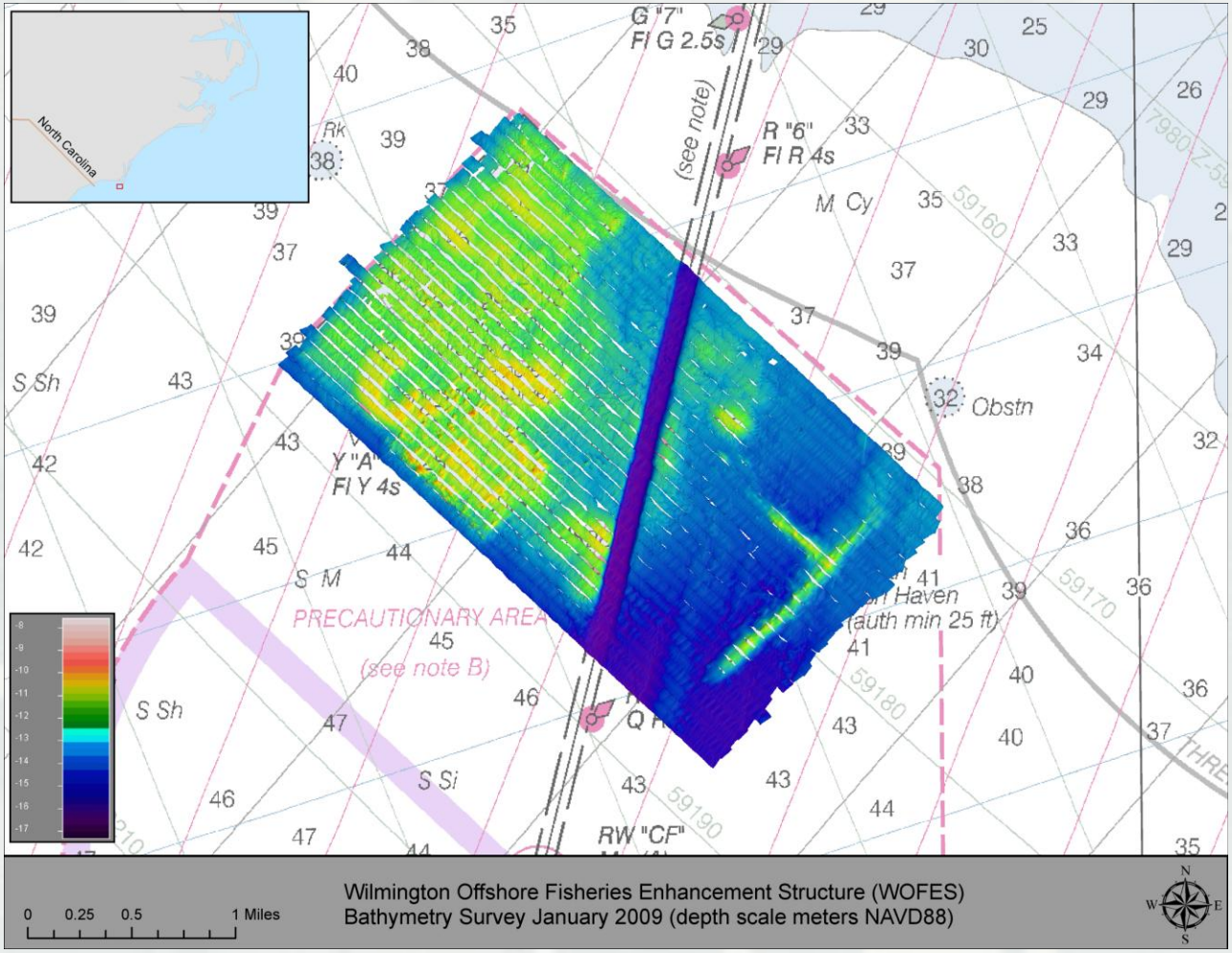

Chocolate Bayou – marsh creation


Houston Ship Channel – Evia Island – 6 acre bird nesting habitat


Houston Ship Channel– Bolivar Marsh creation/channelization

Notable SWG Beneficial Use Projects

Example EWN Solutions

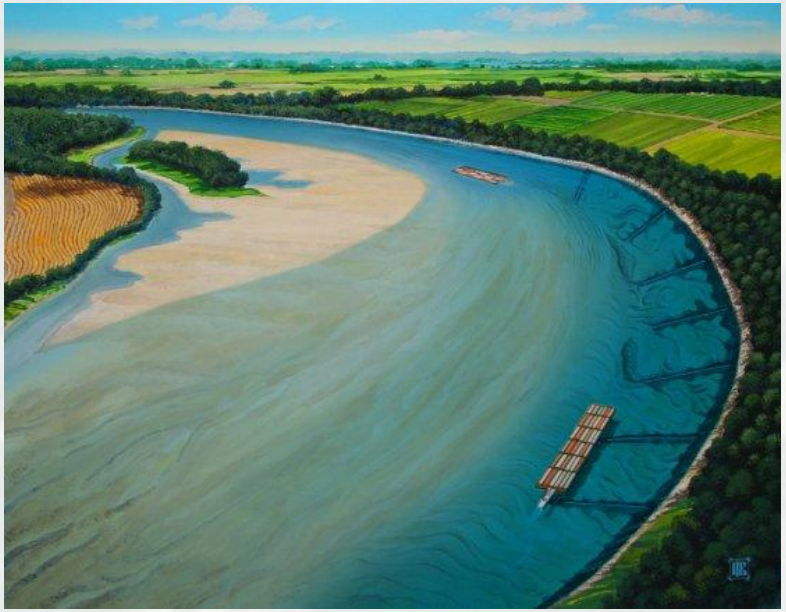


Wilmington Offshore Fisheries Enhancement Structure

Example EWN Solutions
Ashtabula Breakwater Tern Habitat

Example EWN Solutions

Upper Mississippi River Training Structures: Chevrons



River Bendway Weirs

2013 EWN Action Demonstration Projects

- Sediment Retention Engineering to Facilitate Wetland Development (San Francisco Bay, CA)
- Realizing a Triple Win in the Desert: Systems-level Engineering With Nature on the Rio Grande (Albuquerque, NM)
- Atchafalaya River Island and Wetlands Creation Through Strategic Sediment Placement (Morgan City, LA)
- Portfolio Framework to Quantify Beneficial Use of Dredged Material (New Orleans and New England)
- Engineering Tern Habitat into the Ashtabula Breakwater (Ashtabula, OH)
- Living Shoreline Creation Through Beneficial Use of Dredged Material (Duluth, MN)
- A Sustainable Design Manual for Engineering With Nature Using Native Plant Communities

2014 EWN Action Demonstration Projects

- Landscape Evolution of the Oil Spill Mitigation Sand Berm in the Chandeleur Islands, Louisiana
- Guidelines for Planning, Design, Placement and Maintenance of Large Wood in Rivers: Restoring Process and Function (Collaboration with BoR)
- The Use and Value of Levee Setbacks in Support of Flood Risk Management, Navigation and Environmental Services (a strategy document)
- Strategic Placement of Sediment for Engineering and Environmental Benefit (an initial guide to opportunities and practices)

Engineering With Nature Across USACE

- Collaborating with NAP, LRE, SPN, MVN, on using sediment to enhance coastal resilience
- SWG and LRB serving as “proving grounds” for district-wide integration of EWN principles and practices

SWG: First EWN "Proving Ground"

- October 2014
- ~40 participants
- SWG, SWD, ERDC, IWR and HQ
- Identified opportunities to implement EWN within current and future projects

Collaboration with USFWS on EWN and Endangered Species Act

- USACE spends $300M per year on ESA compliance
- Combining ESA 7(a)(1) authority with EWN presents opportunity to reduce time and cost, while increasing benefits for species conservation

Engagement with NGOs

- National Wildlife Federation
  - Use of EWN for conservation and NNBF
- Environmental Defense Fund
  - Coastal resilience investment
- The Nature Conservancy
  - Science for Nature and People (SNAP)- Integrating Natural Defenses into Coastal Disaster Risk Reduction
- National Fish and Wildlife Foundation
  - “Building Ecological Solutions to Coastal Community Hazards”
    - Collaboration with NJDEP, NWF, USACE, Sustainable Jersey, NJ Sea Grant Consortium

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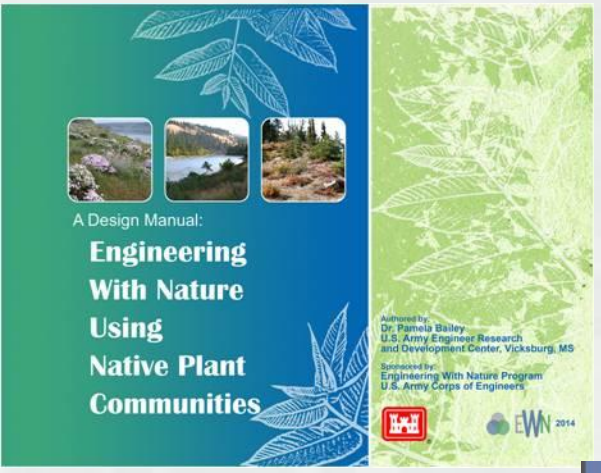
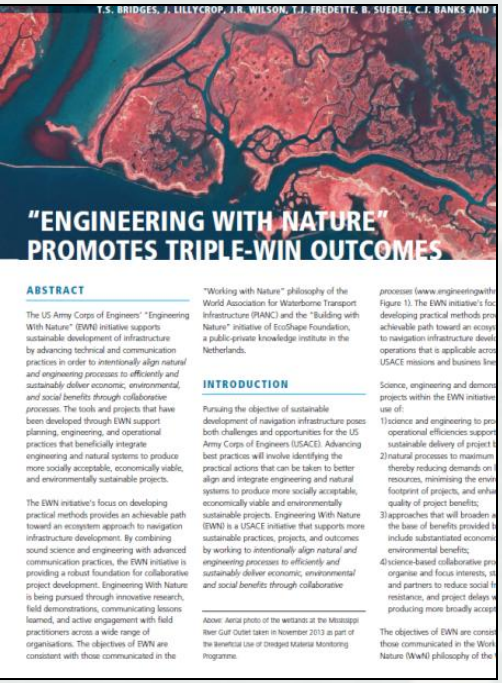
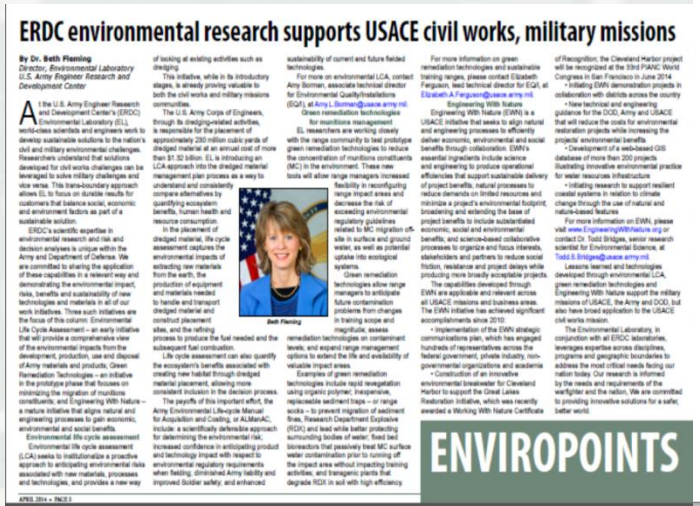
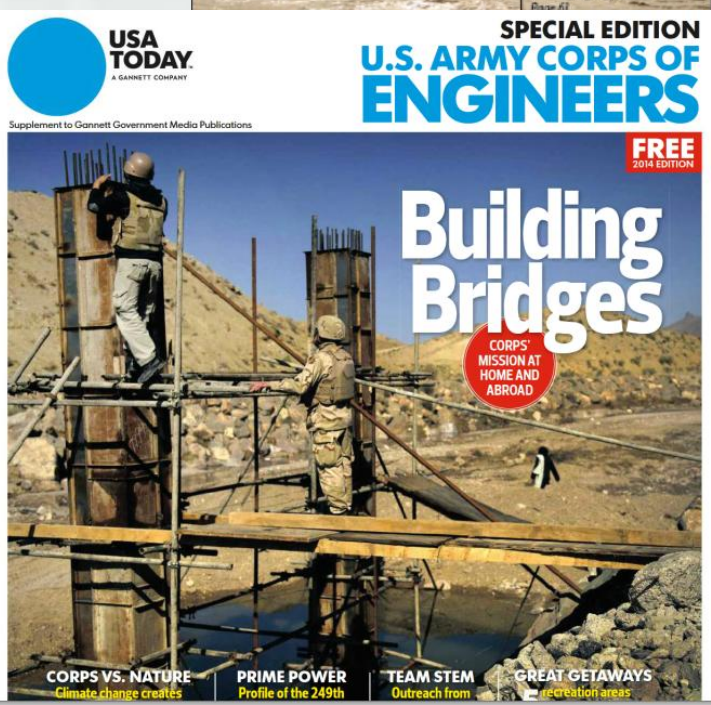
Publications and Recognition

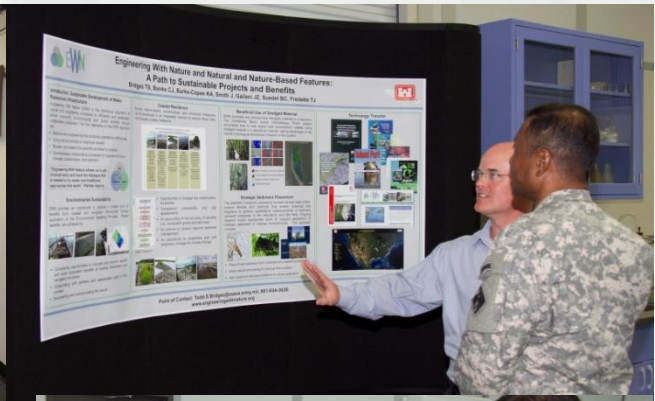


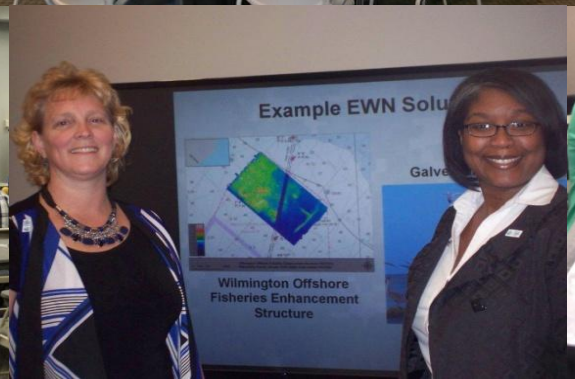






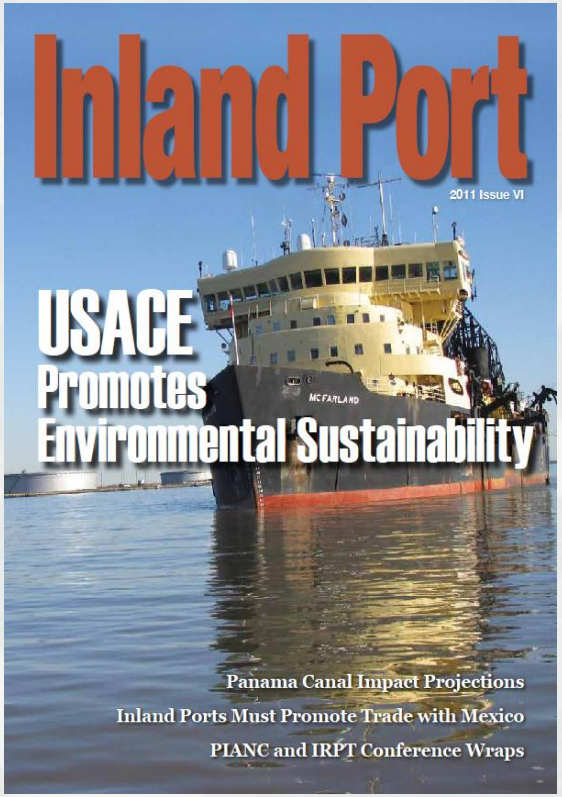
Engagement and Workshops





Creating Value by Engineering With Nature

- Value arguments resonate
- Correcting the hyper-focus on risk is achieved by giving more attention to compensating benefits
- There are potentially valuable allies in “unlikely” places
- Our projects have the potential to product multiple benefit streams but we have to claim them and share the stories!



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